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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,199	02/16/2004	Chien-Sheng Yang	ADTP0086USA	2198

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EXAMINER	
DOAN, THERESA T	

ART UNIT	PAPER NUMBER
2814	

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/708,199	YANG, CHIEN-SHENG	
	Examiner	Art Unit	
	Theresa T. Doan	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5-15,17 and 19-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5-15,17 and 19-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/10/06 has been entered. An action on the RCE follows.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3, 5-15, 17, 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (APA) in view of Sun (U.S Pat. 6,307,452) and further in view of Habermehl et al. (U.S Pat. 6,174,820) as previously cited.

Regarding claims 1, 6, 8-11, 13-15 and 22, APA (Fig. 1) discloses a capacitive semiconductor pressure sensor comprising: a semiconductor substrate 12 (see paragraph [0006], lines 4-6); a conductive movable silicon diaphragm 14 (see

paragraph [0006], lines 7-8); a silicon supporter 16 positioned on the substrate 12 for fixing two ends of the silicon diaphragm 14 (see paragraph [0006], lines 7-9) and forming a sealed cavity 18 between the silicon diaphragm 14 and the substrate 12 (see paragraph [0006], lines 7-10); a stationary electrode 20 positioned within the substrate 12 and below the diaphragm 14, the stationary electrode 20 and the diaphragm 14 constituting a plate capacitor (see paragraph [0006], lines 12-16); and a thin film transistor (TFT) control circuit 22 positioned on the semiconductor substrate 12 and electrically connected to the plate capacitor (see paragraph [0006], lines 17-24).

APA does not disclose that a stationary electrode directly position on the glass or quartz substrate.

However, Sun (Figs. 5A-5B) teaches a MEMS device having a platinum metal stationary electrode 14 directly positioned on a glass substrate 12 (column 2, lines 55-56) in order to provide the capacitive structure having a metal as a bottom electrode (column 2, line 67 and column 3, lines 1-3). Accordingly, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the device of APA by forming the platinum metal stationary electrode directly position on the glass substrate in order to provide the capacitive structure having a metal as a bottom electrode, as taught by Sun (column 2, line 67 and column 3, lines 1-3). It would also have been obvious to form the silicon movable diaphragm and the silicon supporter of APA with polysilicon because the polysilicon is well known conductive material and commonly used for the capacitor plates, as taught by capacitive structure disclosed in Fig. 4 of Habermehl. Fig. 4 of Habermehl discloses a capacitive structure having a

conductive movable diaphragm 110 and a supporter are made of polysilicon (column 13, lines 19-36) because polysilicon having a low value of residual stress (column 3, lines 5-10).

Regarding claims 3, 5, 17 and 19, APA does not disclose the TFT control circuit, which is a low temperature or a high temperature polysilicon TFT control circuit.

However, Habermehl teaches a MEMS device having a TFT control circuit, which is a low temperature or a high temperature polysilicon TFT control circuit (column 4, lines 1-12, column 6, lines 63-67 and column 7, lines 1-7) in order to use the electronic circuit device that depends on the fabrication process being employed. Accordingly, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the device of APA by forming the TFT control circuit at a low temperature or a high temperature in order to use the electronic circuit device that depends on the fabrication process being employed, as taught by Habermehl.

Regarding claims 7 and 12, APA (Fig. 1) discloses wherein the diaphragm 14 and the supporter 16 are formed simultaneously. It is note that the process limitation (simultaneously) would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced. In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985).

4. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (APA), Sun, Habermehl et al., as applied to claim 10 above and further in view of Shrauger (U.S 2003/0020094).

APA, Sun and Habermehl do not disclose the control circuit being electrically connected to the stationary electrode and the diaphragm via the flexible printed circuit board.

However, Shrauger (Fig. 4) teaches the forming of a plurality electronic components (MEMs) on printed circuit board and being electrically connected to each other. Accordingly, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the device of APA by forming the control circuit being electrically connected to the stationary electrode and the diaphragm via the flexible printed circuit board in the above combination device because such a forming structure of connection arrangements are well known and commonly used for providing the electrical connections between the electronic components, as taught by Shrauger.

5. Claims 1, 3, 5, 7-10, 12-15, 17, 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (4,849,374) in view of Habermehl et al. (U.S Pat. 6,174,820) as previously cited.

Regarding claims 1, 8-10, 13-15 and 22, Chen (Fig. 4) discloses a capacitive semiconductor pressure sensor (column 3, lines 33-36) comprising: a non-single-crystal-silicon-based substrate 3 selected from the group consisting of glass (see column 2, lines 58-60); a conductive movable silicon diaphragm 1 (column 2, lines 56-

57 and column 3, lines 40-43); a silicon supporter positioned on the glass substrate 3 for fixing two ends of the silicon diaphragm 1 and forming a sealed cavity 7 between the silicon diaphragm 1 and the substrate 3 (see column 3, lines 45-48); a metal stationary electrode 4 directly positioned on the glass substrate 3 and below the diaphragm 1, the stationary electrode 4 and the diaphragm 1 constituting a plate capacitor (see Fig.4 and column 2, lines 10-31).

Chen does not disclose that a thin film transistor (TFT) control circuit positioned on the glass substrate and electrically connected to the plate capacitor.

However, Habermehl (Fig. 4) shows a thin film transistor (TFT) control circuit 54 comprising a plurality of transistors that positioned on the substrate and electrically connected to the plate capacitor (MEMs) 52 for forming an accelerometer (column 11, lines 37-39). Accordingly, it would have been obvious to form a thin film transistor on the based substrate and electrically connected to the plate capacitor of MEMs in order to form an accelerometer, as taught by Bhattacharyya (column 11, lines 37-39). It would also have been obvious to form the silicon movable diaphragm and the silicon supporter of APA with polysilicon because the polysilicon is well known conductive material and commonly used for the capacitor plates, as taught by capacitive structure disclosed in Fig. 4 of Habermehl. Fig. 4 of Habermehl discloses a capacitive structure having a conductive movable diaphragm 110 and a supporter are made of polysilicon (column 13, lines 19-36) because polysilicon having a low value of residual stress (column 3, lines 5-10).

Regarding claims 3, 5, 17 and 19, Chen does not disclose the TFT control circuit, which is a low temperature or a high temperature polysilicon TFT control circuit.

However, Habermehl teaches a MEMS device having a TFT control circuit, which is a low temperature or a high temperature polysilicon TFT control circuit (column 4, lines 1-12, column 6, lines 63-67 and column 7, lines 1-7) in order to use the electronic circuit semiconductor device that depends on the fabrication process being employed. Accordingly, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the device of Chen by forming the TFT control circuit at a low temperature or a high temperature in order to use the electronic circuit device that depends on the fabrication process being employed, as taught by Habermehl.

Regarding claims 7 and 12, Chen's Fig. 4 further discloses that the diaphragm and the supporter 1 are formed simultaneously.

6. Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (4,849,374) in view of Habermehl et al. (U.S Pat. 6,174,820) as applied to claims 1 and 10 and further in view of Sun (U.S Pat. 6,307,452).

Chen and Habermehl do not disclose that the stationary electrode comprises aluminum (Al), titanium Ti), platinum (Pt) or alloys.

However, Sun (Figs. 5A-5B) teaches a MEMS device having a platinum metal stationary electrode 14 directly positioned on a glass substrate 12 (column 2, lines 55-

56) in order to provide a low resistivity electrical path and avoid oxidizing (column 3, lines 1-2). Accordingly, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the device of Chen by forming the platinum metal stationary electrode because such the platinum metal as a stationary electrode would provide a low resistivity electrical path and avoid oxidizing, as taught by Sun (column 3, lines 1-2).

7. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen, Habermehl et al., as applied to claim 10 above and further in view of Shrauger (U.S 2003/0020094).

APA and Habermehl do not disclose the control circuit being electrically connected to the stationary electrode and the diaphragm via the flexible printed circuit board.

However, Shrauger (Fig. 4) teaches the forming of a plurality electronic components (MEMs) on printed circuit board and being electrically connected to each other. Accordingly, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the device of Chen by forming the control circuit being electrically connected to the stationary electrode and the diaphragm via the flexible printed circuit board because such a forming structure of connection arrangements are well known and commonly used for providing the electrical connections between the electronic components, as taught by Shrauger.

Response to Arguments

Applicant's arguments with respect to claims 1, 3, 5-15, 17 and 19-22 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Theresa T. Doan whose telephone number is (571) 272-1704. The examiner can normally be reached on Monday to Friday from 7:00AM - 4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, WAEL FAHMY can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Theresa Doan
February 2, 2006.